

WHAT IS CLAIMED IS:

1. An eye construction for a toy doll, the eye construction comprising:

a housing (10) with a mouth to which a hollow frame (13) is attached;

an eyelid body (20) pivotally arranged inside the housing (10) and

behind the hollow frame (13);

an eyeball body (30) pivotally arranged inside the housing (10) and

behind the eyelid body (20);

an eyelid moving control plate (40) securely mounted inside the housing

(10), wherein a first pushing rod (42) and a second pushing rod (43) are movably

attached on the eyelid moving control plate (40) via two memory alloy wires

(60), wherein the first and the second pushing rods (42)(43) alternately push the

eyelid body (20) thus allowing the eyelid body (20) to generate a blinking action;

an eyeball moving control plate (50) securely mounted inside the

housing (10), wherein a third pushing rod (52) and a fourth pushing rod (53) are

movably attached on the eyeball moving control plate (50) via two memory alloy

wires (60'), wherein the third and the fourth pushing rods (52)(53) alternately

push the eyeball body (30) thus allowing the eyeball body (30) to generate a

rotation; and

a control circuit board (70) arranged inside the housing (10) and

electrically connected to the memory alloy wires (60)(60') on the eyelid moving

control plate (40) and eyeball moving control plate (50), wherein the control

circuit board (70) provides a current to the memory alloy wires (60)(60').

2. The eye construction as claimed in claim 1, wherein the housing is

formed by an upper case (11) and a lower case (12) both correspondingly

1 combined together, where the mouth is thus defined at one side of the housing
2 (10), wherein the frame body (13) has a hemispherical shell on which a through
3 hole is defined.

4 3. The eye construction as claimed in claim 1, wherein the eyelid body
5 (20) is formed by a hemispherical shell on which an opening (21) is defined,
6 where an upper portion above the opening (21) is wider than a lower portion of
7 the eyelid body (20);

8 a pair of first stubs (22) extending from an outer surface of opposite
9 sides of the eyelid body (20), wherein the eyelid body (20) is pivotally attached
10 inside the housing (10) via the two first stubs (22); and

11 a lengthwise block (23) extending from an edge of the eyelid body (20)
12 near one of the two stubs (22).

13 4. The eye construction as claimed in claim 1, wherein the eyeball body
14 (30) is formed by a hemispherical ball, and a front arcuate surface of the
15 hemispherical ball is used for forming a pupil pattern;

16 two second stubs (31) respectively formed at a top side and a bottom side
17 of an outer surface of the eyeball body (30), whereby the eyeball body (30) is
18 pivotally attached inside the housing (10) via the two second stubs (31); and

19 a lateral block (33) formed at a center of an inner surface of the eyeball
20 body (30).

21 5. The eye construction as claimed in claim 3, wherein the eyeball body
22 (30) is formed by a hemispherical ball, and a front arcuate surface of the
23 hemispherical ball is used for forming a pupil pattern;

24 two second stubs (31) respectively formed at a top side and a bottom side

1 of an outer surface of the eyeball body (30), whereby the eyeball body (30) is
2 pivotally attached inside the housing (10) via the two second stubs (31); and
3 a lateral block (33) formed at a center of an inner surface of the eyeball
4 body (30).

5 6. The eye construction as claimed in claim 4, wherein the eyelid
6 moving control plate (40) and the eyeball moving control plate (50) both have
7 two buckling protrusions (41)(51) formed at an upper edge and a lower edge of
8 the eyelid moving control board (40) and the eyeball moving control plate (50) to
9 correspondingly insert through apertures (14)(15) defined in the upper and lower
10 cases (11)(12).

11 7. The eye construction as claimed in claim 5, wherein the eyelid
12 moving control plate (40) and the eyeball moving control plate (50) both have
13 two buckling protrusions (41)(51) formed at an upper edge and a lower edge of
14 the eyelid moving control board (40) and the eyeball moving control plate (50) to
15 correspondingly insert through apertures (14)(15) defined on the upper and
16 lower cases (11)(12).

17 8. The eye construction as claimed in claim 6, wherein the eyelid
18 moving control plate (40) has an outer surface in which two concavities are
19 defined to respectively retain the first pushing rod (42) and the second pushing
20 rod (43), and each concavity is communicated with a hole defined through the
21 eyelid moving control plate (40);

22 wherein one distal end of each of the first and the second pushing rods
23 (42)(43) is formed as a stepping block (421)(431) from which a column
24 (422)(432) extends, after the first and the second pushing rods (42)(43) are

1 retained in said concavities, the two columns (422)(432) respectively protrude
2 through the two holes.

3 9. The eye construction as claimed in claim 7, wherein the eyelid
4 moving control plate (40) has an outer surface in which two concavities are
5 defined to respectively retain the first pushing rod (42) and the second pushing
6 rod (43), and each concavity is communicated with a hole defined through the
7 eyelid moving control plate (40);

8 wherein one distal end of each of the first and the second pushing rods
9 (42)(43) is formed as a stepping block (421)(431) from which a column
10 (422)(432) extends, after the first and the second pushing rods (42)(43) are
11 respectively retained in said concavities, the two columns (422)(432) protrude
12 through the two holes.

13 10. The eye construction as claimed in claim 8, wherein multiple wire
14 protrusions (44) are formed on an inner surface of the eyelid moving control
15 plate (40) so that the two memory alloy wires (60) are securable to the wire
16 protrusions (44);

17 wherein each memory alloy wire (60) has two ends that respectively
18 connect to a first conductive member (61) and a second conductive member (62),

19 wherein each first conductive member (61) is securely mounted on the
20 inner surface of the eyelid moving control plate (40) and each second conductive
21 member (62) is moveable relative to the eyelid moving control plate (40) and
22 further buckles to a spring (63);

23 the two columns (422)(432) on the stepping block (421)(431)
24 individually linked to a respective one of the second conductive members (62).

1 11. The eye construction as claimed in claim 9, wherein multiple wire
2 protrusions (44) are formed on an inner surface of the eyelid moving control
3 plate (40) so that the two memory alloy wires (60) are securable to the wire
4 protrusions (44);

5 wherein each memory alloy wire (60) has two ends that respectively
6 connect to a first conductive member (61) and a second conductive member (62),

7 wherein each first conductive member (61) is securely mounted on the
8 inner surface of the eyelid moving control plate (40) and each second conductive
9 member (62) is moveable relative to the eyelid moving control plate (40) and
10 further buckles to a spring (63);

11 the two columns (422)(432) on the stepping block (421)(431)
12 individually linked to a respective one of the second conductive members (62).

13 12. The eye construction as claimed in claim 6, wherein the eyeball
14 moving control plate (50) has an outer surface on which two concavities are
15 defined to retain the third pushing rod (52) and the fourth pushing rod (53), and
16 each concavity is communicated with a respective hole defined through the
17 eyeball moving control plate (50);

18 wherein one distal end of each of the third and the fourth pushing rods
19 (52)(53) is formed as a stepping block (521)(531) from which a column (522)
20 extends, after the third and the fourth pushing rods (42)(43) are retained in said
21 concavities, whereby the two columns (522) respectively protrude through the
22 two holes.

23 13. The eye construction as claimed in claim 7, wherein the eyeball
24 moving control plate (50) has an outer surface on which two concavities are

1 defined to respectively retain the third pushing rod (52) and the fourth pushing
2 rod (53), and each concavity is communicated with a hole defined through the
3 eyeball moving control plate (50);

4 wherein one distal end of each of the third and the fourth pushing rods
5 (52)(53) is formed as a stepping block (521)(531) from which a column (522)
6 extends, after the third and the fourth pushing rods (42)(43) are respectively
7 retained in said concavities, whereby the two columns (522) respectively
8 protrude through the two holes.

9 14. The eye construction as claimed in claim 10, wherein the eyeball
10 moving control plate (50) has an outer surface in which two concavities are
11 defined to retain the third pushing rod (52) and the fourth pushing rod (53), and
12 each concavity is communicated with a respective hole defined through the
13 eyeball moving control plate (50);

14 wherein one distal end of each of the third and the fourth pushing rods
15 (52)(53) is formed as a stepping block (521)(531) from which a column (522)
16 extends, after the third and the fourth pushing rods (42)(43) are respectively
17 retained in said concavities, whereby the two columns (522) respectively
18 protrude through the two holes.

19 15. The eye construction as claimed in claim 11, wherein the eyeball
20 moving control plate (50) has an outer surface on which two concavities are
21 defined to retain the third pushing rod (52) and the fourth pushing rod (53), and
22 each concavity is communicated with a respective hole defined through the
23 eyeball moving control plate (50);

24 wherein one distal end of each of the third and the fourth pushing rods

(52)(53) is formed as a stepping block (521)(531) from which a column (522) extends, after the third and the fourth pushing rods (42)(43) are respectively retained in said concavities, the two columns (522) respectively protrude through the two holes.

16. The eye construction as claimed in claim 12, wherein multiple wire protrusions (54) are formed on an inner surface of the eyeball moving control plate (50) so that the two memory alloy wires (60') are twisted around the wire protrusions (54);

wherein each memory alloy wire (60') has two ends that respectively connect to a first conductive member (61') and a second conductive member (62'),

wherein each first conductive member (61') is securely mounted on the inner surface of the eyeball moving control plate (50) and each second conductive member (62') is moveable relative to the eyeball moving control plate (50) and further buckles to a spring (63');

wherein the two columns (522) on the stepping block (521)(531) of the third and the fourth pushing rods (52)(53) are individually linked to a respective one of the second conductive members (62').

17. The eye construction as claimed in claim 13, wherein multiple wire protrusions (54) are formed on an inner surface of the eyeball moving control plate (50) so that the two memory alloy wires (60') are twisted around the wire protrusions (54);

wherein each memory alloy wire (60') has two ends that respectively connect to a first conductive member (61') and a second conductive member

1 (62'),

2 wherein each first conductive member (61') is securely mounted on the
3 inner surface of the eyeball moving control plate (50) and each second
4 conductive member (62') is moveable relative to the eyeball moving control
5 plate (50) and further buckles to a spring (63');

6 wherein the two columns (522) on the stepping block (521)(531) of the
7 third and the fourth pushing rods (52)(53) are individually linked to a respective
8 one of the second conductive members (62').

9 18. The eye construction as claimed in claim 14, wherein multiple wire
10 protrusions (54) are formed on an inner surface of the eyeball moving control
11 plate (50) so that the two memory alloy wires (60') are twisted around the wire
12 protrusions (54);

13 wherein each memory alloy wire (60') has two ends that respectively
14 connect to a first conductive member (61') and a second conductive member
15 (62'),

16 wherein each first conductive member (61') is securely mounted on the
17 inner surface of the eyeball moving control plate (50) and each second
18 conductive member (62') is moveable relative to the eyeball moving control
19 plate (50) and further buckles to a spring (63');

20 wherein the two columns (522) on the stepping block (521)(531) of the
21 third and the fourth pushing rods (52)(53) are individually linked to a respective
22 one of the second conductive members (62').

23 19. The eye construction as claimed in claim 15, wherein multiple wire
24 protrusions (54) are formed on an inner surface of the eyeball moving control

1 plate (50) so that the two memory alloy wires (60') are twisted around the wire
2 protrusions (54);

3 wherein each memory alloy wire (60') has two ends that respectively
4 connect to a first conductive member (61') and a second conductive member
5 (62'),

6 wherein each first conductive member (61') is securely mounted on the
7 inner surface of the eyeball moving control plate (50) and each second
8 conductive member (62') is moveable relative to the eyeball moving control
9 plate (50) and further buckles to a spring (63');

10 wherein the two columns (522) on the stepping block (521)(531) of the
11 third and the fourth pushing rods (52)(53) are individually linked to a respective
12 one of the second conductive members (62').